

- 1- Define each of the following:
Operating Systems, System Calls., process, Shared Memory, Message system, Blocking receive, Non-blocking send, Sockets, Pipes, Parallelism, Concurrency, Data parallelism, Task parallelism, Short-Term scheduler, Long-Term Scheduler, Dispatcher, Dispatch Latency, Waiting Time, Turnaround Time, Throughput.
- 2- What is *Independent* process and *Cooperating* process and what are the advantages of process cooperation?
- 3- What are the three primary thread libraries?
- 4- Using a diagram, explain the difference between Concurrency and Parallelism?
- 5- Using a diagram briefly explain the relationship between API – System Call – OS?
- 6- List five operating system services?
- 7- What are Four Operating System Structure?
- 8- What are the benefits of multithreaded programming?
- 9- What is the different between user thread and kernel thread with example?
- 10- What are 3 multithread models? example? .
- 11- Using a diagram, explain Windows Threads Data Structures?
- 12- Draw a diagram that illustrates the function of Medium Term Scheduler?
- 13- What is the different between Asymmetric multiprocessing and Symmetric multiprocessing ?
- 14- Explain briefly the CPU Scheduling Criteria?
- 15- What are the differentiate between Preemptive and non-preemptive scheduling
- 16- Write the full name of each of the following abbreviations:
 - i. API:
 - ii. SJF:
- 17- Suppose that the following processes arrive for execution at the times indicated. Each process will run the listed amount of time.

Process	Arrival Time	Burst Time
<i>P1</i>	0.0	9
<i>P2</i>	4.0	5
<i>P3</i>	5.0	3
<i>P4</i>	6.0	1

Compute the average waiting time for these processes using the preemptive SJF scheduling algorithm (SRTF)?